bundle of fibres each side of the middle line, and connected with the *commissura anterior*, with the *pars frontalis commissuræ anterioris* as described by Osborn for the kangaroo, by Flower and Sander for some other marsupials, by Ganser for the mole, and by Hamilton for the human brain. A second portion of the paper deals with the conformation of that portion of the Sylvian aqueduct which may be considered the homologue of the *torus longitudinalis* in the bony fishes.

Ueber den feineren Bau des Vorderhirns der Amphibien. A. OYARZUN. Archiv f. Mikros. Anatomie. B. XXXV, H. 3. Juni, 1890.

The author worked under the direction of Edinger and studied the forebrain in some amphibia (frog, triton and salamander). It has been the current view that undoubted ganglion cells could not be demonstrated in the mantel of the forebrain in vertebrates lower than the reptiles, and hence the homologue of the cerebral cortex of the mammals was considered to be first recognizable in this group. By using a modification of Golgi's method, Oyarzun has been able to demonstrate connective tissue cells and ganglion cells also in the mantel of these amphibia and show that the direction of the axis-cylinder processes from the ganglion cells is that which might be expected. The entire arrangement of the mantel is highly embryonic even in the adult frog, and this gives additional ground for considering the mantel in this case as but slightly differentiated.

II.—EXPERIMENTAL.

Les lois de la fatigue étudiées dans les muscles de l'homme. par ARNALDO MAGGIORA. Travaux de Lab. de Physiol. de Turin, 1889, p. 213. Also, Arch. f. Anat. u. Phys. (Phys. Abth.), H. 3-4, 1890, p. 191.

This is an experimental study, on the muscles of man, of the influences which favor and hinder muscular work. The experiments were made on the flexor muscles of the middle finger. The movements of the finger were recorded by the method described by Prof. A. Mosso in a paper having the same title as this and published in *Travaux de Lab. de Physiol. de Turin*, 1889,—p. 150, also *Archiv. Ital. de Biol.* XIII. p. 123, in a paper read before the Internat. Cong. of Physiol. at Basel, Sept. 1889, and in the *Archiv f. Anat. u. Physiol.* 1890, p. 89.

In the experiments of the author the muscles were stimulated voluntarily or by an induction current applied directly to them or their nerves. The contractions were always maximal, occurred at regular intervals and raised a weight of known amount, the weight being supported during the intervals. The contractions were continued until the power to raise the weight was lost. The record gave the height to which the weight was lifted by each contraction and thus the total amount of work done was readily computed. The amount of work possible was found to vary with the weight and the intervals of rest between the succeeding contractions.

With small weights the work can be continued a very long time even when the contractions succeed each other rapidly. With larger weights, one or more kilos, there is a certain weight for each individual with which, at a given rhythm, he can do the most work before the fatigue becomes complete. The curve of fatigue may be a straight line with a certain weight and a certain rhythm. If the rest between the succeeding contractions be ten seconds no fatigue is seen. The interval is sufficient for the restoration processes to be complete. This recalls the life long work of the heart. An interval of rest sufficient to prevent fatigue by a medium weight is insufficient with a larger weight. It is